Reg. No. :

Question Paper Code : 40799

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Fifth Semester

Civil Engineering

CE 6502 – FOUNDATION ENGINEERING

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. What is the objective of soil investigation ?
2. Define standard penetration number.
3. In what way the local shear failure differs from general shear failure ?
4. Define co-efficient of settlement.
5. Explain the procedures for the SPT, SCPT and Plate load test.
6. What are the circumstances necessitating combined footing ?
7. What is modulus of sub grade reaction (Ks) ?
8. State the methods of pile driving.
9. Enumerate the assumptions made in Rankine's theory.
10. What are the stability conditions should be checked for the retaining wall ?

PART – B (5×13=65 Marks)

11. a) Explain static cone penetration test in detail.

(OR)

b) Describe the salient features of a good sub-soil investigation report.

12. a) A footing foundation of 3 m × 3 m is to be constructed at a site at a depth of 1.5 m below ground level. The water table is at the base level of foundation. The average static cone penetration resistance obtained at the site is 20 kg/m^2. The soil is cohesive determine the safe bearing capacity for a settlement of 40 mm.

(OR)

b) Explain in different modes of failure of foundation soil.

13. a) Explain the procedure for designing the P.C.C. strip footings.

(OR)

b) Design a square footing to carry a load of 1000 kN on a column 300 × 300 mm allowable soil pressure 200 kN/m². Permissible stress 500 kN/m². Use M20 and Fe415 steel.

14. a) Explain the dynamic formulae for estimating the load carrying capacity of a single driven pile.

(OR)

b) Design a square pile group to carry 400 kN in clay with an unconfined compressive strength of 60 kN/m². The piles are 300 mm diameter and 6 m long. Adhesion may be taken as 0.6.

15. a) A retaining wall of 6 m high has a saturated backfill of soft clay soil. The properties of the clay soil are γ_{sat} = 17.56 kN/m³, unit cohesion Cu =18 kN/m². Determine (a) the expected depth of tensile crack in the soil (b) the active earth pressure before the occurrence of tensile crack, and (c) the active pressure after the occurrence of tensile.

(OR)

b) A rigid retaining wall of 6 m height has two layers of back fill. The top layer upto depth of 1.5 m is sandy clay having $\varphi = 30°C$, c = 0, γ = 17.25 kN/m³.

PART – C **(1×15=15 Marks)**

16. a) A strip footing 2 m wide carries a load intensity of 400 kN/m² at a depth of 1.2 m in sand. The saturated unit weight of sand is 19.5 kN/m³ and unit weight above water table is 16.8 kN/m³. The shear strength parameters are c = 0 and $\Phi = 35°$. Determine the factor of safety with respect to shear failure for the following cases of location of water table. Determine the ultimate bearing capacity of the footing, if the ground water table is located (a) at a depth of 0.5 m below the ground surface, (b) at a depth of 0.5 m below the base of the footing, (c) at the base of footing, (d) at the ground level. Use Terzaghi theory.

(OR)

b) A trapezoidal footing is to be produced to support two square columns of 30 cm and 50 cm sides respectively. Columns are 6 meters apart and the safe bearing capacity of the soil is 400 kN/m². The bigger column carries a load of 500 kN and the smaller carries a load of 3000 kN. Design a suitable size of the footing so that if does not extend beyond the face of the columns.

Anna Univ Notes, Syllabus, Question Papers @ www.AllAbtEngg.com